

convenient methods for investigating the embryology of these animals.

Besides, the enormous mass of other marine animals waits equally for the establishment of laboratories provided with aquariums, before the study of their embryology can safely, and with due prospect of success, be taken in hand. And that the common ancestors of all the higher animals have lived in the sea, and must have left the traces of their nature still in the embryos of marine animals, is more than likely. Every attempt, therefore, to get back to these ancestors, and to build up scientific genealogy, must lead to the investigation of the embryology of marine animals, must cause, in consequence, the desire of having laboratories near the coast, provided with tanks and continual streams of sea water, to overcome the mere mechanical difficulties of the study.

These are reasons of the most imperious nature to move all those who can do something, to combine their exertions for the foundation of zoological stations near the sea-coast.

When I therefore proposed, in the name of the Committee for the Foundation of Zoological Stations, the erection of such a station at Torquay, my principal object was to create a greater facility for English zoologists to execute scientific works of the above-mentioned nature. Without denying one moment the immense benefit zoology has always derived from English naturalists, one may justly lament that embryology has not found so many students in a country which has such great opportunities of following the study as, for example, has been the case in Germany. England abounds in splendid localities for the study of marine animals; the innumerable harbours, firths, and bays yield an immense material for the scientific observer. Students at the universities would have the easiest access to these localities, and would gain a great mass of information from them; but circumstances have directed almost the whole scientific spirit in another direction—almost all the biologists are occupied with the completion of the faunistic records of the English seas. The existence of a zoological station at Torquay must lead to a greater cultivation of the other branches of marine zoology by Englishmen, and must open also for foreign zoologists the opportunities yielded by the fauna of the south coast of England for carrying in studies in comparative anatomy and embryology.

It will be essential, not only for the progress of zoology in general, but also for the development of the whole scheme for the foundation of zoological stations, that those countries which contribute by their natural position most to the progress of marine zoology should be provided first with zoological stations. If zoological stations in other parts of the world outside Europe are to be founded, they will require above all zoologists to conduct them. Where are these at present to be found? Nowhere, I believe. If, therefore, the great object of my plan is to be attained, it will only be by gradually and consistently developing its base—the foundation of stations in Italy, Britain, France, Norway, and perhaps Spain or Portugal. With the help of these stations, zoologists may be educated who would be inclined to go to remoter places, such as, for instance, Capetown, Ceylon, Japan, or Australia, and conduct or work only for a couple or more years in the stations built in those countries. There can be no doubt

that the benefit for science would be enormous if there existed efficient working stations in these countries; but to make them efficient the principal means is to give them well-instructed naturalists at their head, and this is at present not possible.

Therefore I take the opportunity of repeating once more that it seems to be essential to proceed with the foundation of a zoological station at Torquay, and to head that station by a young, laborious zoologist, who is already experienced in histological and embryological work. It cannot but be that science, and especially British science, will derive considerable benefit from such a proceeding.

Naples, Jan. 2

ANTON DOHRN

THE NATURAL HISTORY OF EGYPT AND MALTA

Notes of a Naturalist in the Nile Valley and Malta. By Andrew Leith Adams, M.B. (Edinburgh: Edmonston and Douglas, 1871.)

FEW men have better opportunities for furnishing valuable contributions to the Natural History of foreign parts than surgeons attached to the Army and Navy; an education in at least the rudiments of natural science, combined with abundant leisure, presenting means which are not at the disposal of all travellers. As a rule, we fear that this class of men have done but little for Science compared with what might have been expected of them. There are, however, some honourable exceptions, among them our present author, whose "*Wanderings of a Naturalist in India*" has been already given to the public, and who now publishes the results of the labours of his leisure hours and vacation rambles in the investigation of the archæology and natural history of the Lower Nile and Malta.

The most interesting portion of Dr. Adams's researches in Egypt and Nubia relates to the evidence as to the period when the northern portion of the African Continent became elevated above the sea. On this point he says:—

"The discovery of the common cockle and other marine shells far inland, and over vast tracts of Algeria and the desert of Sahara, even up to height of more than 900 ft. above the present level of the Mediterranean, and at a depth of 300 ft. below it, fully establishes the fact that a large portion of North Africa was, at no very distant period, covered by the ocean; moreover, that the highlands of Algeria, Tunis, Morocco, and Barbary, were at this period separated from Africa by sea, and that the submergence occurred during the modern or post-tertiary period. Further researches have also proved that the same description of phenomena are to be observed along the borders of the Red Sea. A question therefore suggested itself to me in 1863, whether or not Egypt and Nubia had participated in the same continental movements. Accordingly, no opportunities were omitted during our short sojourn in Lower Egypt in searching for similar evidences of upheaval and depression, but, owing to the flatness of the country, drifting of the desert sands, and great expanse of cultivation on the river's banks, and our rapid movements, I was unable to discover any traces. It was not until we approached the frontier of Nubia, and passed the first cataract, that favourable opportunities were presented. The Nile, now contracted by the porphyritic and sandstone rocks, flows between steep banks, and creating accumulations of alluvium and bendings and openings in

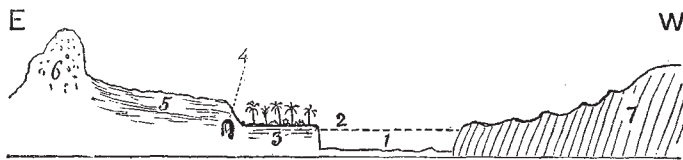
its course, the desert may be said to come down to its margin.

"Wherever these Nile deposits exist, there may be seen clusters of date and doom palms, and fields, whilst further back stand the mud-built villages of the natives; and still more inland are observed plateaus and terraces at variable levels, covered with finely rounded angular stones and drifted sand. These terrace cliffs continue, with broken intervals, from below the first cataract up to the extreme point attained by us at the top of the second cataract. The observer may have some difficulty at first in tracing these river terraces, but, after a little experience, there will be no trouble in making them out. Let him proceed from the river (1) across the alluvial plain (3), on which stands Der, the capital of Nubia, to the ruined temple (4) of Rameses the Great, on the verge of the cultivated tract, then mount the plateau immediately above (5), and wander inland until he gains a height of 130 ft. above the highest mark of the inundation (2), and commence digging among the stones, when he will come to a reddish-brown soil, highly impregnated with natron, which the natives collect for top-dressing on their fields below. There he will find abundance of Nile shells distributed throughout the soil from the margin of the cliff above the temple inland for upwards of a mile, and until the drifted sand of the desert makes it difficult or impossible to trace them further; indeed, the same appearances are observable along the right bank of the river throughout the

distance just indicated. These fossil fluviatile shells belong to species nearly all of which have been proved to exist in the Nile at the present day, and comprise the following species, determined from specimens sent to the Geological Society of London, and examined by the late eminent conchologist Mr. S. P. Woodward:—*Unio lithophagus* (?) *Bulimus pullus*, *Paludina bulimoides*, *Aetheria semilunata*, *Cyrena fluminalis* and variety *trigona*, *Iridina nilotica*."

From these data Dr. Adams concludes that Egypt and Nubia participated in like movements with other portions of the Continent to the east and west; but whether or not, in common with them, they were entirely submerged under the sea at the same epoch, is not so clear, as no marine shells have yet turned up in either Egypt or Nubia.

At Malta, the author's researches were chiefly devoted to an investigation of the fossil mammalian remains in which this group of islands is so rich, for which purpose the British Association, at the suggestion of Dr. Falconer, Mr. Busk, and Captain Spratt, voted 60*l.* in 1863 in aid of his explorations. These Maltese mammalian remains are of unusual interest, comprising the *Hippopotamus Pentlandi*, an animal about as large as the existing Nile species; the *Elephas melitensis* of Falconer, or Pigmy



Maltese Elephant, not more than 4½ ft. in height; the still smaller *Elephas Falconeri* of Busk, the average height of which at the withers could not have exceeded 2½ to 3 ft.; a new large species, named by Dr. Adams, from the place of its discovery, *Elephas Mnaidra*, the Gigantic Fossil Dormouse, *Myoxus melitensis*, described by Dr. Falconer to be "as big in comparison to the living dormouse as the bandicoot rat to a mouse," and the Hollow-jawed Dormouse, *Myoxus Cartei*, another new species detected by the author. Conspicuous among other vertebrate remains are those of the Gigantic Swan, *Cygnus Falconeri*, another large swan, several other species of land and water birds, at least two species of fresh-water turtles, and a lizard.

With regard to the recent Molluscan fauna, a small land-snail belonging to the genus *Helix* has been found near St. Paul's Bay, and on the bare limestone cliffs of the west highlands of Gozo two recent shells of the genus *Clausilia*, not apparently found in the adjoining continent or Sicily; and at present these represent the only living animals that can be said to be peculiar to the Maltese Islands. Lists of the fishes and birds of Malta are given at the end, the majority of the latter being birds of passage, with respect to the habits of which some interesting particulars are given.

We have no information with regard to the vegetable productions of the island, and this is to be regretted, as observations made during so long a residence would doubtless have elicited some new and interesting facts. The author, however, has probably acted wisely in not trusting to second-hand information which his own botanical knowledge would not have enabled him to

verify. We find the well-known *Cynomorium* of Gozo, the *Fungus melitensis* of the Knights of St. John, a flowering plant, spoken of as a lichen.

The volume is illustrated with some well-executed woodcuts and lithographic plates, and we recommend it to all interested in the subject.

OUR BOOK SHELF

A Synonymic Catalogue of Diurnal Lepidoptera. By W. F. Kirby. (London: Van Voorst, 1871.)

THE great work on the "Genera of Diurnal Lepidoptera," by Doubleday and Hewitson, completed after the lamented death of the former by the assistance of Prof. Westwood, included under each genus a synonymic list of all the described species which the authors were able to determine. But more than twenty years have elapsed since the completion of this most valuable work, which still remains without a competitor either in this country or on the Continent, and thus our means of reference upon systematic matters connected with the beautiful and interesting group of butterflies generally, have remained at what must be regarded nowadays as a somewhat antiquated standpoint, whilst the business of describing has been carried on with the most astonishing energy. In Britain Doubleday's collaborator Hewitson, and his successor Butler, have described an almost inconceivable multitude of new species, and a considerable number have also been added to the list by Bates and Wallace; whilst on the Continent the Brothers Felder and Dr. Herrich-Schäffer have been equally active. New views have also been put forward as to the natural sequence and limitation of the groups (families and subfamilies) into which the great Rhopalocerous tribe is divided, and the